

DATA SHEET

PIN Diode Chips Supplied on Film Frame

Features

- Designed for high-performance switch and attenuator applications
- Preferred device for module applications
- PIN diodes supplied 100% tested, sawn, mounted on film frame
- Low cost
- Available lead (Pb)-free, RoHS-compliant, and Green



Description

The SMP series of PIN diodes is designed for high-volume switch applications from 10 MHz to beyond 2 GHz. The low current, low capacitance performance of these diodes makes the SMP series particularly suited for battery-operated circuits, power amplifier modules, VCO, T/R switches and other applications. The SMP1302-099 and SMP1304-099 parts are designed as low-distortion attenuators used in TV distribution and cellular base station applications.

NEW Skyworks Green products are lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide and brominated flame retardants.



Absolute Maximum Ratings

| Characteristic | Value |
|---|-------------------|
| Reverse voltage (V_R) | 50 V |
| Power dissipation @ 25 °C at the base of the chip | 250 mW |
| Storage temperature | -65 °C to +150 °C |
| Operating temperature | -65 °C to +150 °C |
| ESD human body model | Class 1 B |

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

Electrical Specifications at 25 °C

| Part Number | Voltage Rating ⁽¹⁾ (V) | Typ. C _J V _R = 0 V F = 1 MHz (pF) | Max. C _J V _R = 10 V F = 1 MHz (pF) | Typ. V _F @ I _F = 10 mA (mV) | Max. R _S I _F = 1 mA F = 100 MHz (Ω) | Max. R _S I _F = 10 mA F = 100 MHz (Ω) | Typical Carrier Lifetime I _F = 10 mA (nsec) |
|--------------------------------|-----------------------------------|--|---|---|--|---|--|
| Switching Applications | | | | | | | |
| SMP1320-099 | 50 | 0.23 | 0.175 | 850 | 2 Typ. | 0.9 | 400 |
| SMP1322-099 | 50 | 1.1 | 0.85 | 825 | 1.5 | 0.45 Typ. | 400 |
| SMP1340-099 | 50 | 0.2 | 0.15 | 880 | 1.7 Typ. | 1.2 | 100 |
| SMP1353-099 | 100 | 0.35 | 0.15 | 825 | 15 | 2.8 | 1000 |
| Attenuator Applications | | | | | | | |
| SMP1302-099 | 200 | 0.27 | 0.15 @ 30 V | 800 | 20 | 3 | 700 |
| SMP1304-099 | 200 | 0.18 | 0.15 @ 30 V | 800 | 50 | 7 | 1000 |

The above PIN diode chips are processed on 100 mm silicon wafers, 100% DC tested, sawn and shipped on 6" film frame hoops.

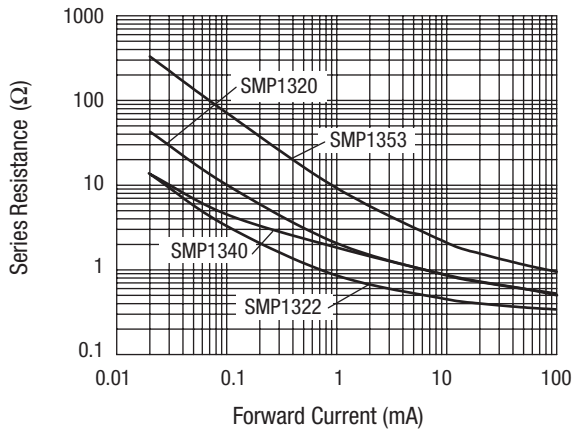
Electrical rejects are identified with black ink.

1. It is not recommended to drive a PIN diode into avalanche breakdown. Permanent damage to the diode may occur.

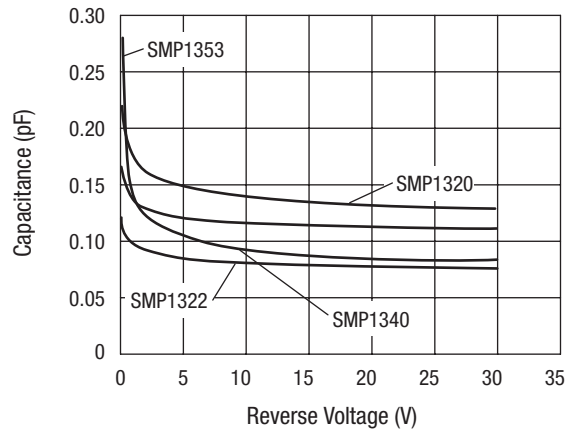
Chip Dimensions

| Part Number | Quantity of Good Diodes Per Wafer Bonding Pad | | Chip Size Nominal (In.) | Chip Height Nominal (In.) | Nominal (In.) |
|-------------|---|--------|----------------------------|------------------------------|-----------------|
| | Min. | Nom. | | | |
| SMP1320-099 | 40,000 | 46,000 | 0.003 ± 0.0003 | 0.0135 ± 0.001 | 0.0055 ± 0.0005 |
| SMP1322-099 | 40,000 | 46,000 | 0.0075 ± 0.0003 | 0.0135 ± 0.001 | 0.0055 ± 0.0005 |
| SMP1340-099 | 65,000 | 72,000 | 0.003 ± 0.0003 | 0.011 ± 0.001 | 0.0055 ± 0.0005 |
| SMP1353-099 | 65,000 | 72,000 | 0.008 ± 0.0005 | 0.011 ± 0.001 | 0.0055 ± 0.0005 |
| SMP1302-099 | 40,000 | 46,000 | 0.0085 ± 0.0005 | 0.0135 ± 0.001 | 0.0055 ± 0.0005 |
| SMP1304-099 | 40,000 | 46,000 | 0.0085 ± 0.0005 | 0.0135 ± 0.001 | 0.01 ± 0.001 |

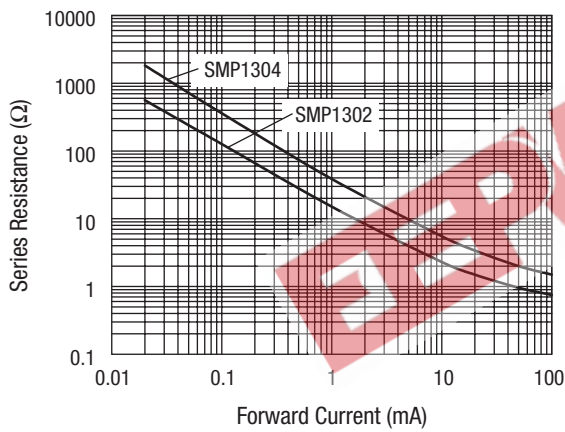
Typical Performance Data at 25 °C



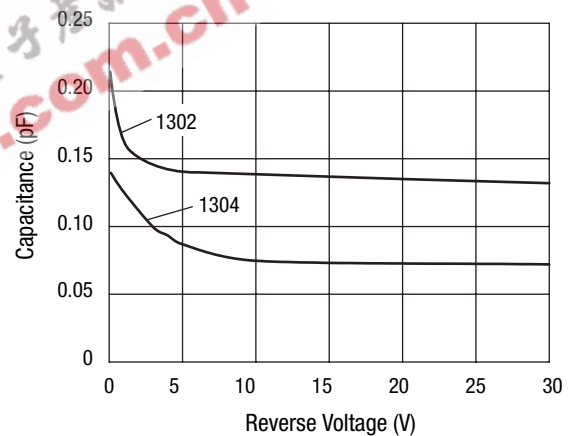
Series Resistance vs. Forward Current @ 100 MHz



Capacitance vs. Reverse Voltage

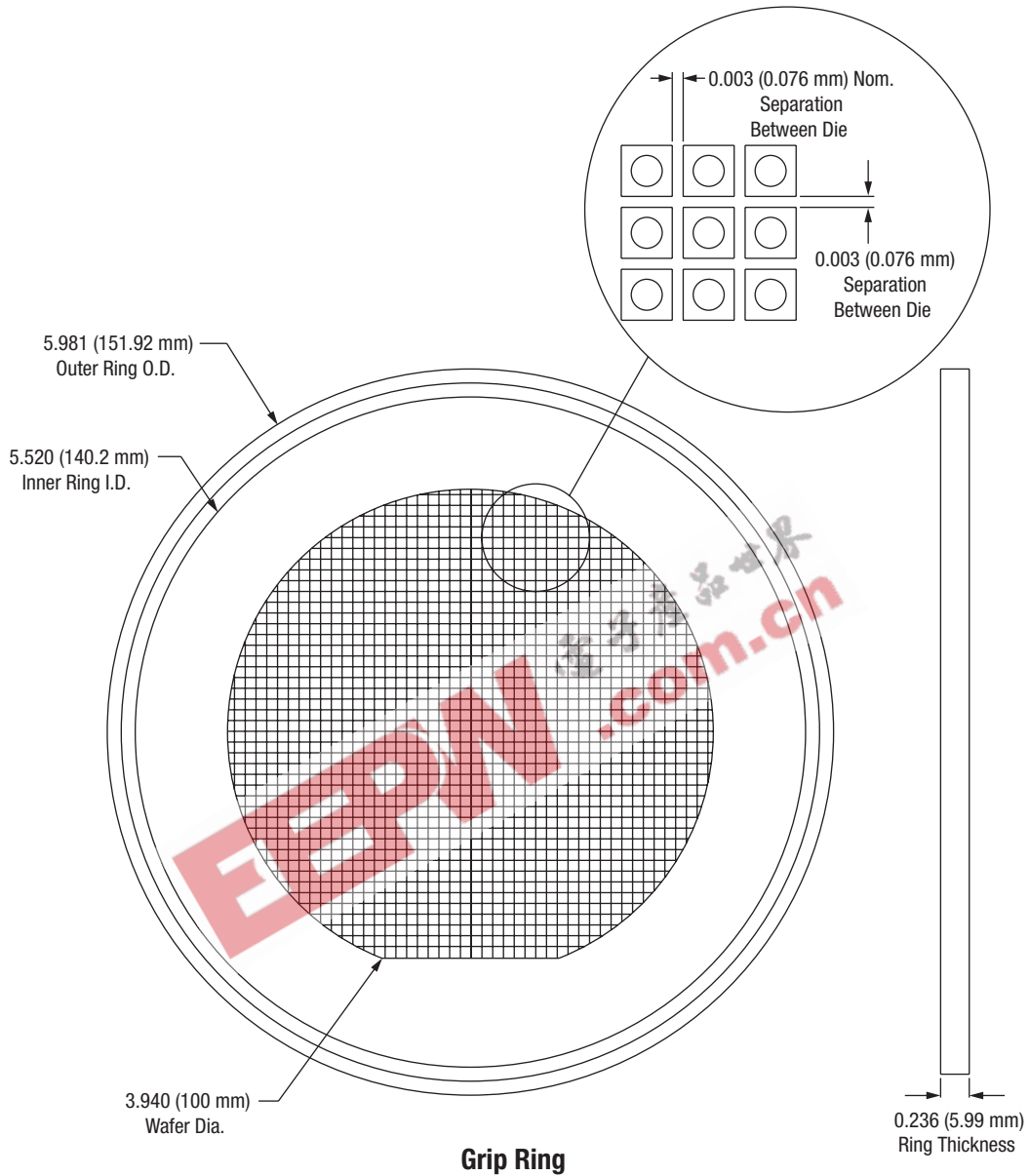


Series Resistance vs. Current @ 100 MHz



Capacitance vs. Reverse Voltage

Wafer On Film



Wafer Film Frame Description

- Wafer on nitto tape
- Color: light blue
- Thickness: 2.2–3 mils
- Tensile strength: 6.6 (lbs. in width)
- Ring material: plastic



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